

# **KANSAS CORPORATION COMMISSION**

## **District #2 Field Office**

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### **Scope of Work**

#### **Installation of Recovery and Monitoring Wells**



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**Galva City Contamination Site (KCC #980033-01)**

**Sections 15 & 22 of Township 19 South & Range 2 West**

**McPherson County, Kansas**

February 11, 2014

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## **GALVA CITY- SCOPE OF WORK**

### **1.0 OBJECTIVES AND BACKGROUND**

The purpose of this well installation event is to either replace recovery/monitoring wells that have been compromised over time and/or expand and delineate the current brine plume at the Galva Site. Proper placement and construction of these well is paramount to the continued efforts to both monitor and remediate the brine plume located near the town of Galva.

In 1997 a report from KDHE that high chlorides had been discovered while GWA had been investigating possible ground water supplies for the city of Galva. The KCC collected and sent in water samples from test wells for analysis and results confirmed the brine was of oil field origin. Monitoring wells have since been placed around the site since 2001 and a remediation system consisting of recovery wells was installed at the site in 2003. The site is sampled annually with a report prepared.

Recovery Well #4 on the northwest side of the remedial site has silted up and is no longer functioning as a recovery well. KCC will pull the equipment from this well for salvage on a new well and plug it (a separate project) according to KDHE rules and regulations. MW-101, MW-1002, and MW-702 have been destroyed by agricultural equipment and/or heave and will be plugged by the KCC (a separate project) according to KDHE rules and regulations.

### **2.0 LOCATION/GEOLOGY/HYDROLOGY**

The Galva City site is located one half mile north and one quarter mile east of the city of Galva, Kansas. The site has 16 monitoring wells that located in section 15 and northern section 22 of T19S & R2W. The remediation system is located in the northern part of section 22.

Local geology consists of fine textured soils that exhibit strong clay-pan development. These soils are underlain by loess deposits of Quaternary Age which lay on top of McPherson Formation sands and gravels. Depth to sands in the area ranges from as little as 5 feet to 60 feet. The Wellington Shale forms the bedrock in the area. The Wellington had been eroded prior to deposition of the McPherson and has erosional contact along with various paleo-valley and related structures. Depth to the Wellington Shale varies throughout the area and ranges from 30 to 90 feet below surface depending on the paleo topography of the shale.

Hydrology of the area consists of shallow aquifers in typical Quaternary unconsolidated sediments. Good water bearing sands that are above the Wellington shale can hold and give good amount of

water. Quality of the water is relatively good in areas not affected by past oil field brines. Rural Water District (RWD) #4 services much of the area. The city of Galva has four operating public supply wells which have been affected by the brine plume the KCC is attempting to remediate. There are many lawn and garden wells in the area, WWC-5s have been filed on most wells but many water wells appear to have been completed prior to requirements or the paperwork was not filed. Groundwater movement is to the south-southwest, but brine contamination tends to follow the bottom of the paleo-valleys and can move slightly different to the overall groundwater flow direction.

### **3.0 SCOPE OF WORK**

#### **3.1 Well Drilling and Installation**

##### **3.1.1 Manner of Drilling and Placement**

KCC Requests that a rotary wash rig be used to drill the proposed wells. This is due to the time constraints that occur with using hollow-stem auger techniques. Hollow-stem augers also have periodic issues in large sand formations of becoming stuck. Wells will be spotted by KCC District #2 geologists in the field and all drilling activities will be overseen by KCC personnel.

##### **3.1.1.1 Monitoring Wells**

All monitoring wells shall be drilled utilizing no less than 5" bit in order to allow for appropriate sand pack and grouting to occur. All wells will be closely logged by the KCC geologist, so samples during drilling must be obtained at a minimum of 5' intervals. Continuous sampling may occur in the lower part of the aquifer where brine contamination is highest. Monitoring wells will be completed using 2" PVC with a minimum of 10' of 0.010 slot PVC screen. KCC may change screen lengths in the field based on geologic logging of each well. All Monitoring wells will have steel protective canisters installed to protect the wells. These canisters must be able to be locked via pad lock.

##### **3.1.1.2 Recovery Wells**

All recovery wells shall be drilled utilizing no less than 8" bit in order to allow for appropriate sand pack and grouting to occur. All wells will be closely logged by the KCC geologist, so samples during drilling must be obtained at a minimum of 5' intervals. Continuous sampling may occur in the lower part of the aquifer where brine contamination is highest. Recovery wells will be completed using 5" PVC with a minimum of 5' of 0.040 slot PVC screen. KCC may change screen lengths in the field based on geologic logging of each well.

### **3.1.2 Wellhead Protection and Electrical Drop**

#### **3.1.2.1 Monitoring Wells**

All Monitoring wells will be protected by canister style locking metal boxes. A 3' by 3' cement pad will be installed per KDHE requirements.

#### **3.1.2.2 Recovery Wells**

All Recovery wells will be protected by a sanitary seal and locked fence to prohibit entry by non-KCC personnel. All Recovery wells will need an approved electrical drop install next to the well. Any equipment usable at the KCC's RW-4 location can be moved and utilized. New part or equipment will need to be purchased if this is not feasible.

### **3.1.3 Sample Collection**

Samples will be collected from the mouth of the tank in no less than 5' intervals. As stated, KCC may request more sampling throughout the drilling process. KCC geologist may also stop drilling at any time to circulate drilling fluids to obtain better samples.

### **3.1.4 Geological Logging**

All borings will be field logged for Lithology and any signs of contamination by the KCC geologist.

## **3.2 Trenching and Fencing**

### **3.2.1 New lines installation**

Depending on the placement of the recovery wells, some new lines may need to be laid from the well to the manifold shed of the recovery system. Existing lines will be utilized if possible. This work can be done during or post well installation activities. Different contractors may be used in order to achieve this. KCC will oversee the placement and connection of all lines, this work should be handled by a contractor with the equipment necessary to complete the job. Lines need to be installed/connected include electrical lines as well as water lines.

### **3.2.2 Mechanical Integrity of New Lines**

All water lines will be tested for mechanical integrity before burial by the contractor under KCC supervision.

### **3.2.3 Fencing in Recovery Wells**

Recovery wells need to be surrounded by a 6' chain link fence with gate. Moving the fence from RW-4 which has become unusable due to build-up and silting is an option for one Recovery well. A new fence will need to be installed if this is not an option. Any parts from RW-4 fence can be used to achieve this.

### **3.3 Mapping/Survey/logs**

Data obtained from the addition of new well and associated boring shall be utilized in future site analysis and investigations.

#### **3.3.1 Written Lithology Logs**

Post installation work will consist of the KCC geologist putting together appropriate logs of all wells that were installed.

#### **3.3.2 Geologic Cross-section**

A geologic cross-section shall be constructed from the logs by the KCC geologist.

#### **3.3.3 New Well Survey**

The Contractor will hire a surveyor licensed in the state of Kansas to survey in the locations and elevations of the new wells.

### **3.4 Written Report of Work**

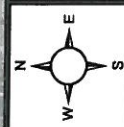
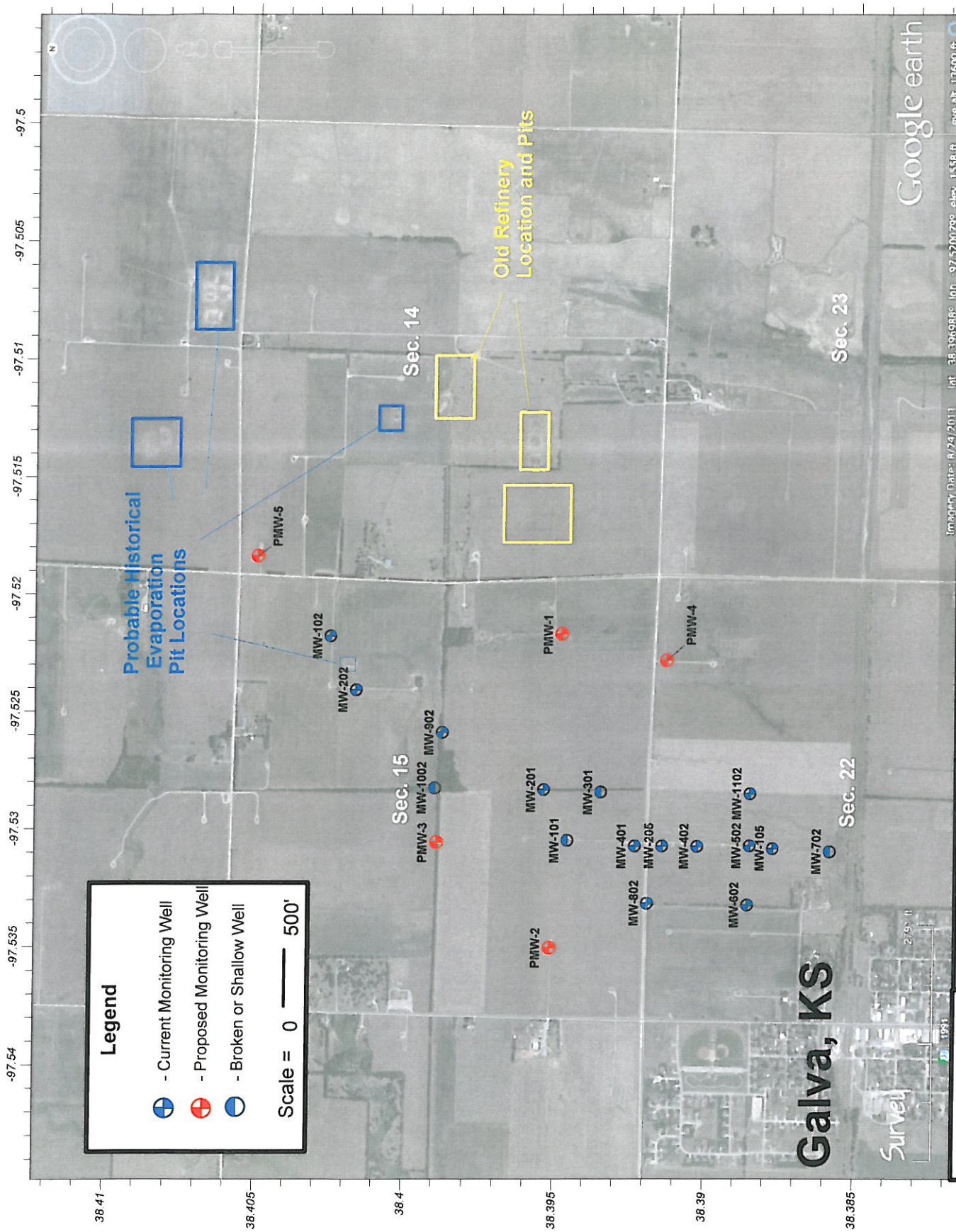
The KCC District Geologist will put together a complete written report on the activities and data collected from the work done. This report will include geologic logs of all borings, a cross-section of the borings, and maps produced from new data along with prior know data. This report will be submitted to the District Supervisor for review and filed in the KCC District #2 Office for documentation.





**Galva City Remedial Site - McPherson County Kansas**  
**Proposed Recovery Well Locations**  
 Drawn by D. Bollenback

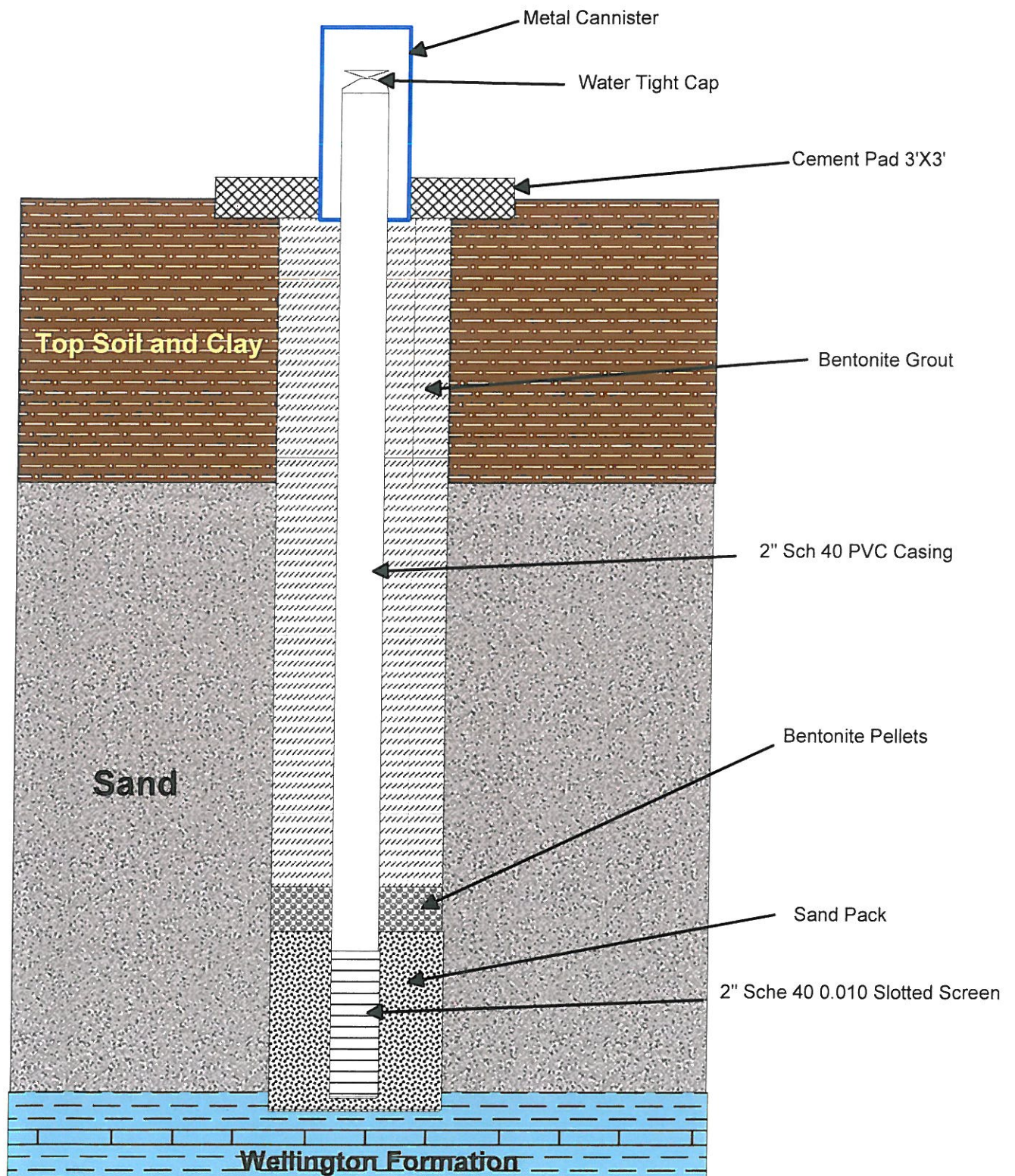




Kansas Corporation Commission - Galva City Remediation Site  
 Phase III Investigation - Proposed New Monitoring Well Locations  
 KCC Control #980033-01 - Drawn by: D. Bollenback

Figure 2-1

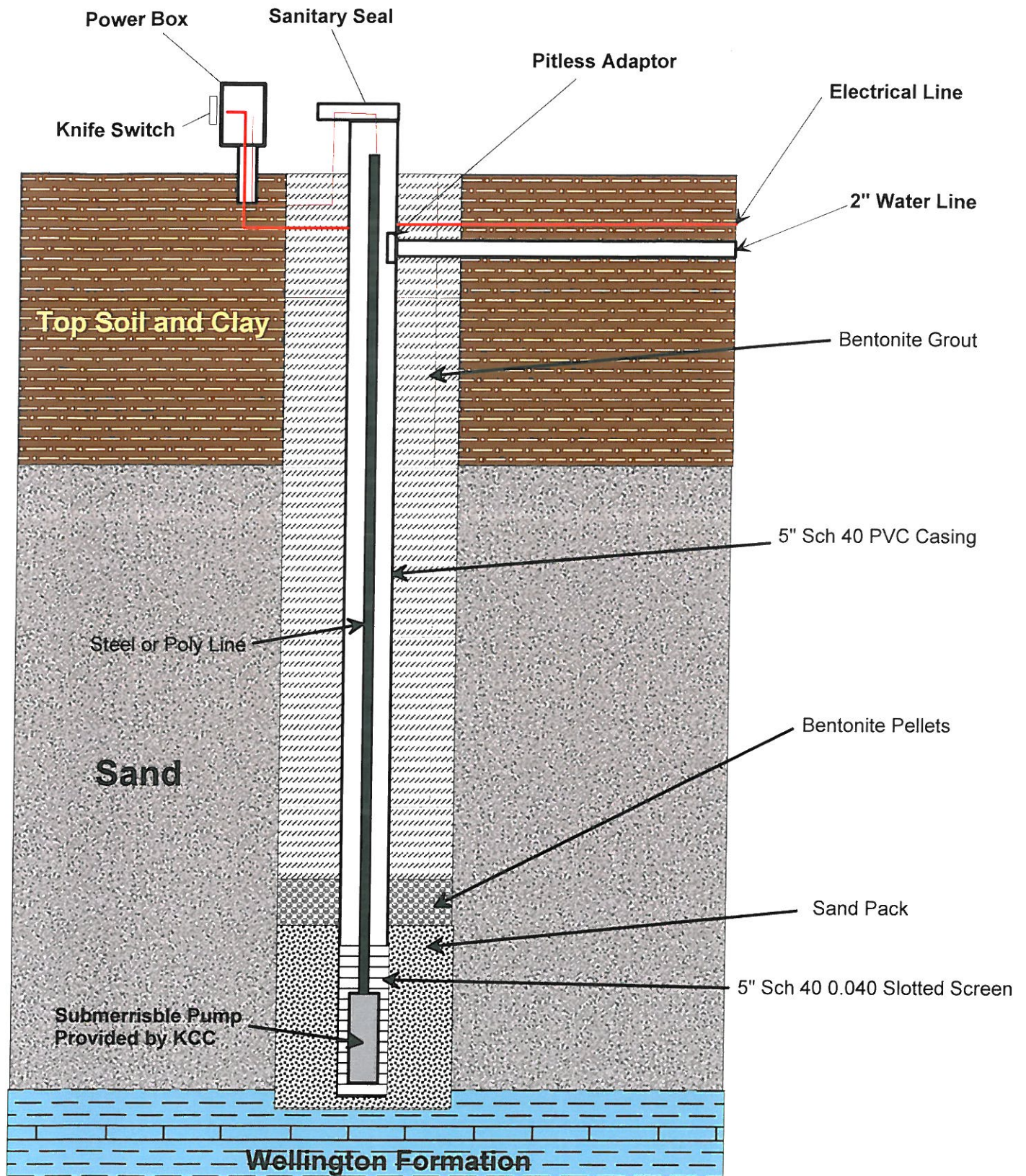




**Galva City Monitoring Well Diagram**  
**Drawn by D. Bollenback**

**Figure**  
**4-1**





**Galva City Recovery Well Diagram**  
**Drawn by D. Bollenback**

**Figure**  
**5-1**